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09/966,427	09/28/2001	Harini V. Sundaresan	TI-31767	6354

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EXAMINER
TORRES, JUAN A

ART UNIT	PAPER NUMBER
2631	.

DATE MAILED: 03/09/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

	Application No.	Applicant(s)
Office Action Summary	09/966,427	SUNDARESAN, HARINI V.
	Examiner	Art Unit	
	Juan A. Torres	2631	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>28 September 2001</u>.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-10* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-10* is/are rejected.

7)☒ Claim(s) *1-10* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☒ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
    Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____.

5)☐ Notice of Informal Patent Application (PTO-152)

6)☐ Other: _____.

DETAILED ACTION

Drawings

The drawings are objected to because

In FIG. 2A block 36 the recitation 1/RL + N is ambiguous. It is suggested to be changed to 1/(RL+N);

In FIG. 2A block 38 the recitation 1M/RL + N is ambiguous. It is suggested to be changed to IM/(RL+N);

In FIG. 5 the recitation 1M/RL is ambiguous. It is suggested to be changed to IM/RL; the recitation 1M/RL + 2 is ambiguous. It is suggested to be changed to IM/(RL+2).

In FIG. 6 the recitation 1M/RL is ambiguous. It is suggested to be changed to IM/RL; the recitation 1M/RL + 2 is ambiguous. It is suggested to be changed to IM/(RL+2).

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering

of the remaining figures. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Figures 1, 2B, 3, 4A, 4B, 4C and 7 should be designated by a legend such as -- Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.121(d)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: block 63 (see specification page 17 line 12 and page 17 line 20). Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the

examiner, the applicant will be notified and informed of any required corrective action in

the next Office action. The objection to the drawings will not be held in abeyance.

Specification

The abstract of the disclosure is objected to because:

In line 13 the recitation "1/RL + 2" is ambiguous; it is suggested to be changed to

"1/(RL + 2)".

In line 15 the recitation "DFT" is ambiguous; it is suggested to be changed to

"Discrete Fourier Transform (DFT)".

Correction is required. See MPEP § 608.01(b).

35 U.S.C. 112, first paragraph, requires the specification to be written in "full,

clear, concise, and exact terms." The specification is replete with terms which are not

clear, concise and exact. The specification should be revised carefully in order to

comply with 35 U.S.C. 112, first paragraph. Examples of some unclear, inexact or

verbose terms used in the specification are:

In page 2 line 5 the recitation "f_d" is ambiguous; it is suggested to be changed to

"f_d" as shown in the equation in line 4 of page 2.

In page 2 line 10 the recitation "$fm(t)$" is ambiguous; it is suggested to be changed

to "$fm(t)$".

In page 2 line 13 the recitation "$fm(t)$" is ambiguous; it is suggested to be changed

to "$fm(t)$".

In page 3 line 19 the recitation "(quadrature-phase baseband" is ambiguous; it is

suggested to be changed to "(quadrature-phase) baseband".

In page 3 line 21 the recitation "$A_c \cos (2\pi f_c + \Phi(t)_{FM}$" is ambiguous; it is suggested to be changed to "$A_c \cos (2\pi f_c + \Phi(t))$". To be also consistence with page 3 line 22.

In page 4 line 3 the recitation "5." is ambiguous; it is suggested to be changed to "5)".

In page 4 line 3 the recitation "$x_{FM}^{(t)}$" is ambiguous; it is suggested to be changed to "$X(t)_{FM}$". To be also consistence with page 4 line 15.

In page 4 line 3 the recitation "$w_c t$" is ambiguous; it is suggested to be changed to "$w_c (t)$". To be also consistence with page 4 line 6.

In page 4 line 4 the recitation "$X_{FM} t$" is ambiguous; it is suggested to be changed to "$X(t)_{FM}$". To be also consistence with page 4 line 15.

In page 4 line 7 the recitation "$\cos w_c t$" is ambiguous; it is suggested to be changed to "$] \cos w_c (t)$".

In page 4 line 11 the recitation "$w_c t$" is ambiguous; it is suggested to be changed to "$w_c (t)$". To be also consistence with page 4 line 6.

In page 4 line 16 the recitation "Figure 2" is ambiguous; it is suggested to be changed to "Figure 3".

In page 4 line 21 the recitation "x=x+jy" is ambiguous; it is suggested to be changed to "z=x+iy".

In page 5 line 2 the recitation "$r = \sqrt{x^2} + y^2$ "is ambiguous; it is suggested to be changed to "$r = \sqrt{x^2 + y^2}$ "

In page 6 line 3 the recitation "IM/RL" is ambiguous; it is suggested to be changed to "(IM/RL)".

In page 7 line 13 the recitation "1/RL" is ambiguous; it is suggested to be changed to "RL".

In page 7 line 14 the recitation "1/RL + 2" is ambiguous; it is suggested to be changed to "1/(RL + 2)".

In page 8 line 22 the recitation "1/RL + 2" is ambiguous; it is suggested to be changed to "1/(RL + 2)".

In page 11 line 16 the recitation "Figure 2" is ambiguous; it is suggested to be changed to "Figure 2A".

In page 11 line 18 the recitation "1/RL + N" is ambiguous; it is suggested to be changed to "1/(RL + N)".

In page 11 line 14 the recitation "the reciprocal value of 1/RL also ranges from -1 to $+1$" is ambiguous; it is suggested to be changed to "the reciprocal value of 1/RL ranges in the intervals $(-\infty, -1]$ and $[1, +\infty)$.

In page 11 line 23 the recitation "1/RL + 2" is ambiguous; it is suggested to be changed to "1/(RL + 2)".

In page 12 line 5 the recitation "1/RL + N" is ambiguous; it is suggested to be changed to "1/(RL + N)".

In page 12 line 20 the recitation "1/RL + N" is ambiguous; it is suggested to be changed to "1/(RL + N)".

In page 12 line 23 the recitation "1/RL + N" is ambiguous; it is suggested to be changed to "1/(RL + N)".

In page 13 line 15 the recitation "IM/RL + 2" is ambiguous; it is suggested to be changed to "IM/(RL + 2)".

In page 13 line 17 the recitation "IM/RL + 2" is ambiguous; it is suggested to be changed to "IM/(RL + 2)".

In page 13 line 19 the recitation "1/RL + 2" is ambiguous; it is suggested to be changed to "1/(RL + 2)".

In page 13 line 22 the recitation "IM/RL + 2" is ambiguous; it is suggested to be changed to "IM/(RL + 2)".

In page 15 line 10 the recitation "4" is ambiguous; it is suggested to be changed to "4)".

In page 5 line 2 the recitation "$\sqrt{I^2} + Q^2$ " is ambiguous; it is suggested to be changed to "$\sqrt{I^2 + Q^2}$ "

In page 5 line 2 the recitation "DFT (differential fourier transform)" is ambiguous; it is suggested to be changed to "DFT (Discrete Fourier Transform)"

In page 17 line 12 the recitation "circuit 63" is ambiguous; because block 63 is not shown in figure 7.

In page 17 line 20 the recitation "selector 63" is ambiguous; because block 63 is not shown in figure 7.

In page 19 line 19 the recitation "1/RL + 2" is ambiguous; it is suggested to be changed to "1/(RL + 2)".

Appropriate correction is required.

The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Objections

Claims 1-7 are objected to because of the following informalities:

It is not clear what is claimed. The recitation in line 1 of claim 1 "In computational circuitry for determining", is suggested to be changed to "A method for determining in a computational circuit".

In line 8 of claim 1 the recitation "1/RL+N" is ambiguous; it is suggested to be changed to "1/(RL+N)"..

In line 10 of claim 1 the recitation "θ+N" is ambiguous; it is suggested to be changed to "(θ+N)".

In line 10 of claim 1 the recitation "1/N+1" is ambiguous; it is suggested to be changed to "1/(N+1)".

In line 10 of claim 1 the recitation "1/N-1" is ambiguous; it is suggested to be changed to "1/(N-1)".

In line 11 of claim 1 the recitation "1/RL + N" is ambiguous; it is suggested to be changed to "1/(RL + N)".

In line 14 of claim 1 the recitation "IM/RL+N" is ambiguous; it is suggested to be changed to "IM/(RL+N)".

Claim 2 is objected to because of the following informalities: the recitation "about 1.1 and about 5" is indefinite and vague. It is suggested to be changed to "1.1 and 5".

Claim 5 is objected to because of the following informalities:

In line 7 of claim 5 the recitation "DFT (differential fourier transform)" is ambiguous; It is suggested to be changed to "DFT (Discrete Fourier Transform)".

In line 9 of claim 5 the recitation "and 360 for" is ambiguous; It is suggested to be changed to "and 360 degrees for".

In line 11 of claim 5 the recitation "and 270" is ambiguous; It is suggested to be changed to "and 270 degrees".

In line 13 of claim 5 the recitation "and 180 to" is ambiguous; It is suggested to be changed to "and 180 degrees to".

In line 13 of claim 5 the recitation "signal," is ambiguous; It is suggested to be changed to "signal, and".

In line 15 of claim 5 the recitation "315" is ambiguous; It is suggested to be changed to "315 degrees".

In line 19 of claim 5 the recitation "data;" is ambiguous; It is suggested to be changed to "data; and".

Claim 7 is objected to because of the following informalities: the recitation "claim I" is indefinite and vague. It is suggested to be changed to "claim 1".

Claims 8-10 are objected to because of the following informalities:

It is not clear what is claimed. The recitation in line 1 of claim 1 "In a DSP

circuitry for determining", is suggested to be changed to "A method for determining in a

DSP (Digital Signal Processor) ".

In line 8 of claim 8 the recitation "1/RL+2" is ambiguous; It is suggested to be

changed to "1/(RL+2)".

In line 10 of claim 8 the recitation "1/RL+2" is ambiguous; It is suggested to be

changed to "1/(RL+2)".

Claim 9 is objected to because of the following informalities:

In line 7 of claim 9 the recitation "DFT (differential fourier transform)" is

ambiguous; It is suggested to be changed to "DFT (Discrete Fourier Transform)".

In line 9 of claim 9 the recitation "and 360 for" is ambiguous; It is suggested to be

changed to "and 360 degrees for".

In line 11 of claim 9 the recitation "and 270" is ambiguous; It is suggested to be

changed to "and 270 degrees".

In line 13 of claim 9 the recitation "and 180 to" is ambiguous; It is suggested to be

changed to "and 180 degrees to".

In line 13 of claim 9 the recitation "signal," is ambiguous; It is suggested to be

changed to "signal, and".

In line 15 of claim 9 the recitation "315" is ambiguous; It is suggested to be

changed to "315 degrees".

In line 19 of claim 9 the recitation "data;" is ambiguous; It is suggested to be

changed to "data; and".

Appropriate correction is required.

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 1-10 rejected under 35 U.S.C. 101 because the disclosed invention is inoperative and therefore lacks utility. The disclosure present a method for computing the value of arctangent (IM/RL) and 7*arctangent (IM/(RL+2)) in all the values of IM in [-1,1], and RL in [-1,1]. The following graphic is a representation of the two values of arctangent (IM/RL) and 7*arctangent (IM/(RL+2)) (in the OY axes) for the case where IM=1 and RL from -1 to 1 (in OX axes):
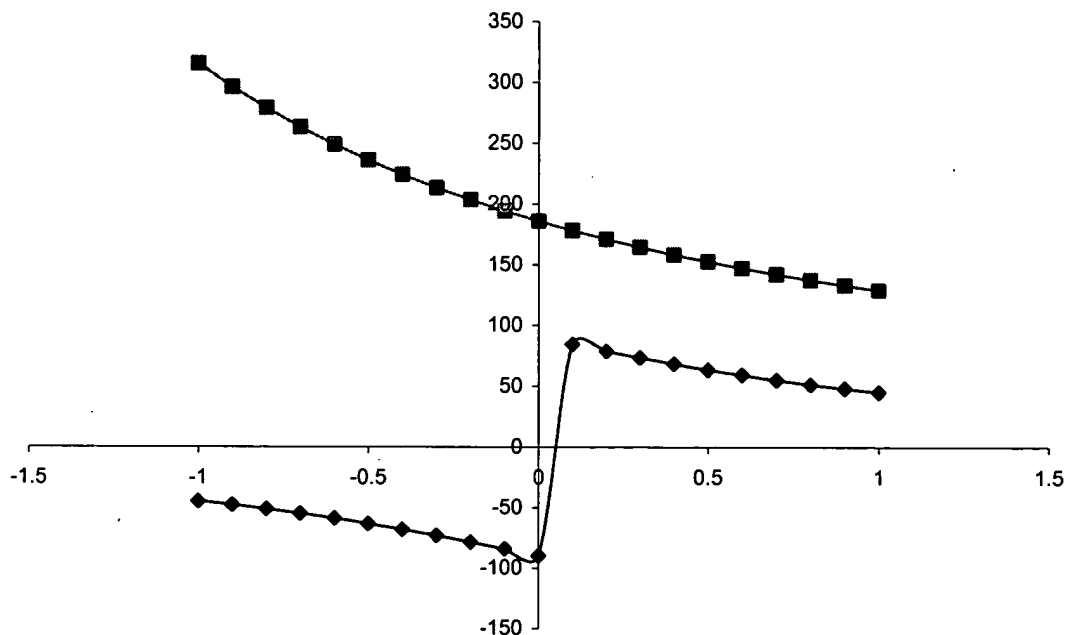
It can be seen that this approach proposed is not valid in any rage of values. The same representation for a value of IM=0.1 is:
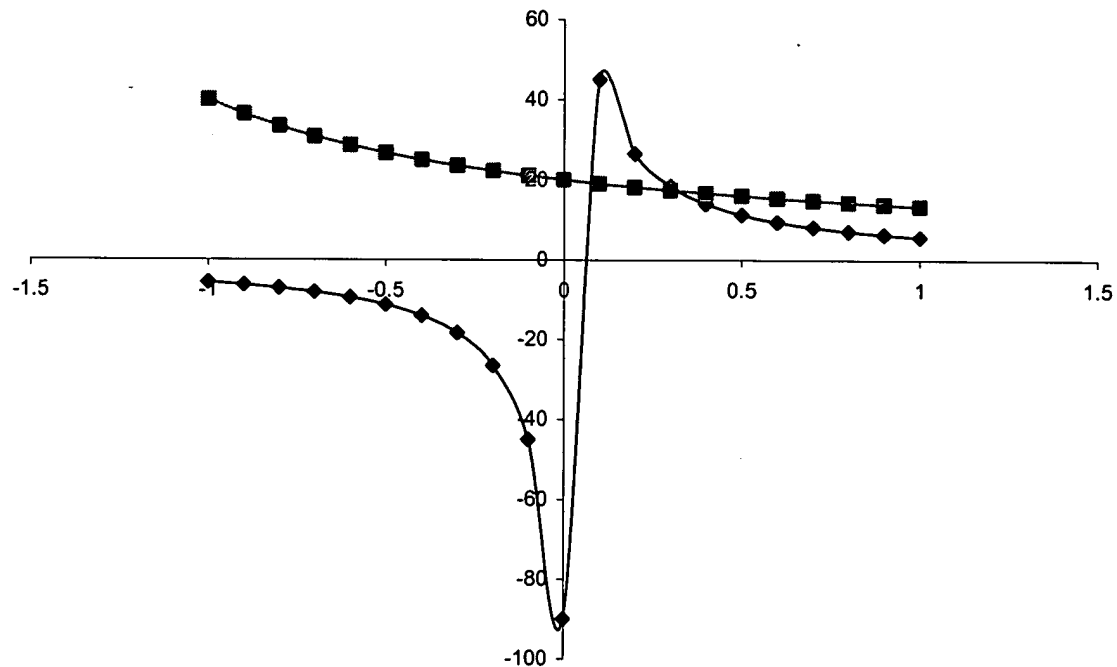

It is evident that the approach is not good at all. The proposed claims lack of utility in the full range of the disclosure.

In the case that the application means the value of ((IM/RL) + 2) instead of (IM/(RL+2)) the approach will also not be true (this case will not be supported by the disclosure). In the case ((IM/RL) + 2) for low values of RL the number 2 is depreciable compare with (IM/RL) and in those cases (RL<<1) the approach will be possible, but with no gain in burden complexity because still the value (IM/RL) have to be computed for RL close to zero. This situation can be shown in the following graphic for the case IM=1.
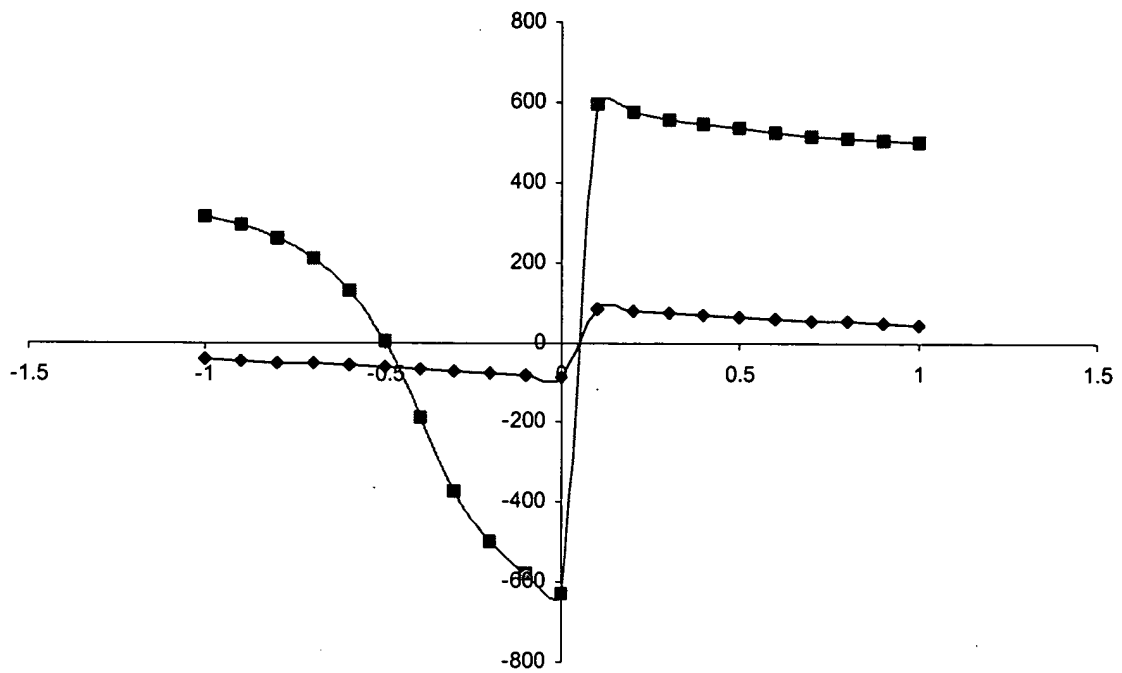
In the case of IM=0.1 the representation will be:
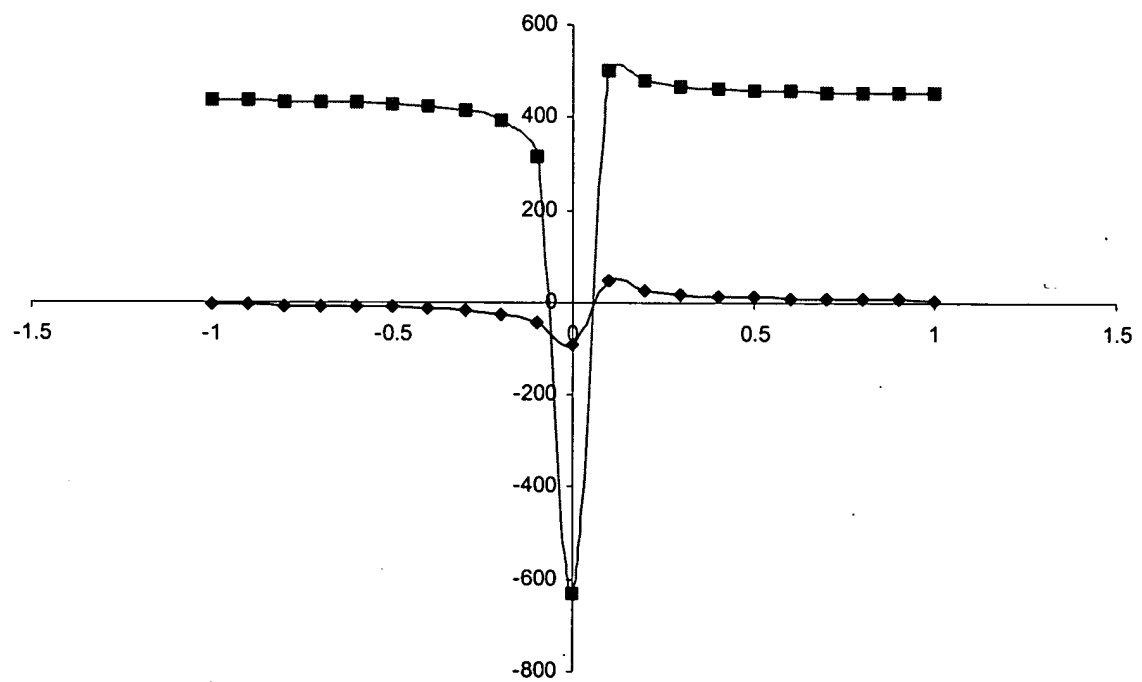
Conclusion

The prior art made of record and not relied upon is considered pertinent to

applicant's disclosure. Hart (US 4750214) discloses that FM signals are demodulated by

digitizing the signals using an A/D converter of predetermined sample frequency and

down-converting the signals to their base band quadrature components. The quadrature

components are delayed by one sample period, and the complex cross-product of

current quadrature components and the delayed quadrature components from the

immediately preceding A/D sample period is taken; the arc tangent of the resulting

cross-product is taken by calculating the ratio of the imaginary and real components to

produce a value which is representative of the original modulating signal. Allpress (US

5694079) discloses an FM demodulator includes an I and Q sampler for generating data

samples of I and Q signals of an FM signal. A signal processor derives samples of a

modulating waveform of the FM signal from the I and Q data samples, using a Lagrange

interpolation function of the I and Q data samples. Variables include derivatives of the I

and Q signals obtained by differentiation of the Lagrange function. Preferably, the

processor further utilizes a correction factor to correct the modulating waveform

samples obtained from the Lagrange-based interpolation, to thereby derive a

modulating waveform exhibiting low signal distortion. Suganuma (US 6229386)

discloses a digital FM demodulation circuit which samples an input analog FM signal

and digitally detects the sampled input signal has an arctangent circuit into which a

second signal that is delayed from the sampled input signal by a constant time, and a

third signal that is different in phase by 90 degrees from the second signal are input,
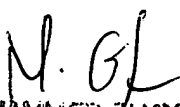
and which outputs a corresponding arctangent value based on a result of a division of the two input signals; the arctangent circuit has: round off means for sequentially rounding the division result to one of plural typical values; and a ROM address unit for performing a control in which an arctangent value corresponding to the rounded typical value is selected from a ROM table containing arctangent values of the typical values, and the selected arctangent value is output.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Juan A. Torres whose telephone number is (571) 272-3119. The examiner can normally be reached on Monday-Friday 9:00 AM - 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mohammad H. Ghayour can be reached on (571) 272-3021. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

MOHAMMED H. GHAYOUR
SUPERVISORY PATENT EXAMINER

JAT   12-18-2004